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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,802	03/12/2004	Xiaolei S. Ao	PAN-215J	8293

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EXAMINER

ASSOUAD, PATRICK J

ART UNIT PAPER NUMBER

2857

DATE MAILED: 07/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/799,802

Applicant(s)

AO ET AL.

Examiner

Patrick J. Assouad

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-33 is/are allowed.
- 6) ☒ Claim(s) 34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/23/05, 5/03/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figs 2a, 2b, 3 and 5-6 are clearly informal. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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3. Claim 34 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Independent claim 34 is directed to "a computer program for calculating the transit time of a pulsed signal through a conduit..." Computer programs, per se, are not statutory subject matter. See MPEP 2106. It should be emphasized that a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory.

REASONS FOR ALLOWANCE

4. The following is an examiner's statement of reasons for allowance: as per claims 1-33, the closest prior art of record is US 6,047,602 to Lynnworth. More particularly, we see in col. 30 of Lynnworth:

These observations on the shakiness of the signals, and the inability of relatively conventional averaging protocols to measure the flow velocity with acceptable accuracy, led applicant to several approaches to improve the accuracy and speed of response. These include: i) varying the prf; ii) relate main bang firing to pressure sensed near the region of flow measurement; iii) do not arbitrarily fire an equal number of pulses in each direction; rather, fire only enough in each direction to obtain a probably valid reading having an acceptable standard deviation, where the probably valid reading is not necessarily the arithmetic mean of many pulses of varying signal to noise ratio (SNR), but rather a weighted average, with weight assigned according, for example, to the signal strength S or the SNR of each individual pulse. As a simple and first numerical example, the weight of each pulse utilized can be its SNR. A more discriminatory weighting formula is to assign weights according to a power of the SNR, say the SNR squared. This means a very strong, high SNR pulse strongly influences the average and for that reason, if strong enough, immediately can be taken as the probably valid reading. In that case the processor can immediately produce a final reading, i.e. not take further interrogations in that direction or attempt to develop a measurement within the standard deviation requirement. The disregard for a large number of interrogations based on their poor "quality" (low SNR) is part of this SNR-

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discriminating method. We shall refer to this weighting method as Darwinian SNR weighting, in the sense that only the strongest signal survives to influence the subsequent calculation of flow. One can say it is a matter of luck, that a particular pulse is launched at a fortuitous time, such that it encounters a minimally-attenuating set of eddies or other sources of scattering, ray bending or other attenuation processes in the fluid. An analogy from optics might be, when driving in a fog, the driver sets and corrects his/her course based on visual clues picked up during moments of relative transparency.

If there are a number of reasonably-strong, moderate- to high-SNR received signals, none of which are so low as to justify discarding them, their transit times can be rms SNR power-weighted as follows: $\frac{1}{\sum_{i=1}^n t_i^n}$ where $n=1, 2, \dots$ or other number, and the t 's are transit times. This shall be referred to as rms SNR weighting.

5. However, the prior art of record, including Lynnworth, does not suggest or disclose the claimed combination of method steps or system elements for calculating the transit time of a pulsed signal transmitted through a conduit, as defined in claims 1-33.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See the attached PTO-892.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J. Assouad whose telephone number is 571-272-2210. The examiner can normally be reached on Tuesday-Friday, 6:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on 571-272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Patrick J Assouad
Primary Examiner
Art Unit 2857

pja